94 5168. (new) The method of claim 86 5160, further comprising maintaining a temperature within the part of the formation within a pyrolysis temperature range, wherein the pyrolysis temperature range is from about 250 °C to about 370 °C.

C11 95 5169. (new) The method of claim 86 5160, further comprising controlling a pressure and a temperature within at least a majority of the part of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

96 5170. (new) The method of claim 86 5160, further comprising producing a mixture from the formation, wherein the produced mixture comprises condensable hydrocarbons having an API gravity of at least about 25°.

97 5171. (new) The method of claim 86 5160, further comprising controlling a pressure within at least a majority of the part of the formation, wherein the controlled pressure is at least about 2.0 bar absolute.

Response To Office Action Mailed May 7, 2002

A. Pending Claims

Claims 2309-2385 and 5150-5171 are currently pending. Claims 2309-2318, 2320, 2335, 2342-2343, 2348-2357, 2359, 2374, and 2381-2382 have been amended. Claims 5150-5171 are new.

B. Election of Species

In item 1 of the Office Action, the Examiner states: "Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable." Applicant elects Species D described at least in claims 2315, 2354, and 5164, without traverse. The generic name of the

elected species is: "natural distributed combustor(s)." Applicant reserves the right for consideration of claims to additional species written in dependent form upon allowance of a generic claim.

C. The Claims Are Not Indefinite Pursuant To 35 U.S.C. § 112, Second Paragraph

Claims 2309-2311, 2315-2350, and 2354-2385 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant respectfully disagrees with these rejections. Applicant respectfully disagrees with this rejection, however, to expedite the case Applicant has amended the above-recited claims.

Applicant respectfully requests removal of the rejections of claims 2309 and 2348 and the claims dependent thereon.

D. Double Patenting Rejection

The Examiner provisionally rejected claims 2309-2385 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2309-2385 of copending Application No. 09/841,293. Applicant respectfully disagrees that the rejection is appropriate. Upon issuance of either the present application or Application No. 09/841,293, Applicant will provide arguments why a double patenting rejection is inappropriate or file a terminal disclaimer disclaiming the appropriate portion of the term of the remaining application.

E. The Claims Are Neither Anticipated By, Nor Obvious Over The Cited Art Pursuant To 35 U.S.C. § 102(b) or 103(a) Respectively

The Examiner rejected claims 2309, 2311, 2315, 2317-2336, 2342-2345, 2348, 2350, 2354, 2356-2375, 2381, and 2382 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 3,924,680 to Terry (hereinafter "Terry").

Applicant respectfully disagrees with these rejections.

The standard for "anticipation" is one of fairly strict identity. To anticipate a claim of a patent, a single prior source must contain all the claimed essential elements. Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 231 U.S.P.Q.81, 91 (Fed. Cir. 1986); In re Donahue, 766 F.2d 531,226 U.S.P.Q. 619,621 (Fed. Cir. 1985).

In order to reject a claim as obvious, the Examiner has the burden of establishing a *prima facie* case of obviousness. *In re Warner et al.*, 379 F.2d 1011, 154 U.S.P.Q. 173, 177-178 (C.C.P.A. 1967). To establish a *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP § 2143.03.

Amended claim 2309 describes a combination of features including: "controlling the heat to yield at least about 15 % by weight of a total organic carbon content of the part of the formation into condensable hydrocarbons." The above quoted feature, in combination with the other features of the claim, does not appear to be taught or suggested by Terry.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck,* 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991), MPEP § 2143.

Applicant submits that heating of a formation, or a portion of a formation, may be controlled (e.g., controlling the heating rate) to obtain selected results. In addition, providing a selected amount of heating energy/day to a volume of a formation may be used to obtain selected results. These methods for obtaining selected results are supported by Applicant's specification.

Applicant's specification states:

> Certain embodiments may include heating a selected volume of a coal formation. Heat may be provided to the selected volume by providing power to one or more heat sources. Power may be defined as heating energy per day provided to the selected volume. A power (*Pwr*) required to generate a heating rate (*h*, in units of, for example, °C/day) in a selected volume (*V*) of a coal formation may be determined by the following equation: $Pwr = h{*}V{*}C_v{*}\rho_B$. In this equation, an average heat capacity of the formation (C_v) and an average bulk density of the formation (ρ_B) may be estimated or determined using one or more samples taken from the coal formation.
> (Specification, page 12, line 30 through page 13, line 6).

Applicant's specification further states:

> Certain embodiments may include controlling the heat provided to at least a portion of the formation such that production of less desirable products in the portion may be substantially inhibited. Controlling the heat provided to at least a portion of the formation may also increase the uniformity of permeability within the formation. For example, controlling the heating of the formation to inhibit production of less desirable products may, in some embodiments, include controlling the heating rate to less than a selected amount (e.g., 10 °C, 5 °C, 3 °C, 1 °C, 0.5 °C, or 0.1 °C) per day.
>
> Controlling pressure, heat and/or heating rates of a selected section in a formation may increase production of selected formation fluids. For example, the amount and/or rate of heating may be controlled to produce formation fluids having an American Petroleum Institute ("API") gravity greater than about 25. Heat and/or pressure may be controlled to inhibit production of olefins in the produced fluids.
> (Specification, page 13, line 20 through page 14, line 2).

Terry states in column 5, lines 10-13, "the heat such as may be supplied by an underlying burning coal formation is allowed to separate the volatile materials in the coal from the carbonized coal." Terry further states in column 5, lines 52-56, "The heat generated by the burning coal in the lower stratum or formation **18** during the gasification process is transmitted through the shale layer **16** separating the coal stratums and supplies the heat for pyrolysis of the upper coal stratum **10**." Terry does not appear to teach or suggest at least the feature of heating a coal formation in a controlled manner to yield about 15% by weight of a total organic carbon content of the part of the formation into condensable hydrocarbons, in combination with the other features of the claim. Applicant requests removal of the anticipation and obviousness rejections

of claim 2309 and the claims dependent thereon.

Amended claim 2348 describes a combination of features including: "controlling the heat to yield greater than about 60 % by weight of total condensable hydrocarbons, as measured by Fischer Assay." At least the above quoted feature, in combination with the other features of the claim, for at least the reasons stated herein above does not appear to be taught or suggested by Terry. Applicant requests removal of the anticipation and obviousness rejection of claim 2348 and the claims dependent thereon.

If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Applicant submits, however, that many of the claims dependent on claims 2309 and 2348 are separately patentable.

Claims 2311 and 2350 recite, in part "further comprising maintaining a temperature within the part of the formation within a pyrolysis temperature range." The features of claims 2311 and 2350, in combination with the features of the independent claims 2309 and 2348 respectively, do not appear to be taught or suggested by the cited art.

The Examiner states, "As per claims 2315, 2354, the lower coal stratum (18) in which the in situ combination occurs in the process of Terry, Figure 2 in order to effect the volatilization/pyrolysis in coal stratum (10), is deemed to comprise a "natural distributed combustor", as broadly recited." Applicant respectfully disagrees.

Claims 2315 and 2354 recite, in part "wherein one or more of the heat sources comprise natural distributed combustors." The features of claims 2315 and 2354, in combination with the features of independent claims 2309 and 2348 respectively, do not appear to be taught or suggested by the cited art.

Applicant's specification states:

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> As used herein, the phrase "natural distributed combustor" generally refers to a heater that uses an oxidant to oxidize at least a portion of the carbon in the formation to generate heat, and wherein the oxidation takes place in a vicinity proximate to a wellbore. Most of the combustion products produced in the natural distributed combustor are removed through the wellbore.
> (Specification, page 31, lines 27-31).

Terry states in column 5, lines 10-13, "the heat such as may be supplied by an underlying burning coal formation is allowed to separate the volatile materials in the coal from the carbonized coal." Terry further states in column 5, lines 52-56, "The heat generated by the burning coal in the lower stratum or formation **18** during the gasification process is transmitted through the shale layer **16** separating the coal stratums and supplies the heat for pyrolysis of the upper coal stratum **10**." Terry does not appear to teach at least the feature of a natural distributed combustor as described in Applicant's specification, where at least the oxidation takes place in a vicinity proximate to a wellbore.

The Examiner states "As per claims 2317, 2318, 2320, 2356, 2357, 2359 Terry inherently or obviously effects a heating rate as recited in these claims based on, e.g., the composition of the coal stratums actually encountered as well as the thickness and characteristics of the intervening shale stratum through which the heat is conducted." Applicant respectfully disagrees, in that the heating rates described in the above claims are in combination with features described in the respective independent claims, 2309 and 2348, which at least include "controlling the heat." As the Examiner has stated, the heating rate using the method as described by Terry is dependent on the characteristics of the coal and intervening shale stratums and not the actual method taught by Terry. The Examiner has not shown that at least the features of a controlled heating rate as described in dependent claims 2317, 2318, 2320, 2356, 2357, and 2359 is taught or suggested in the cited art.

Claims 2319 and 2358 describe a combination of features including: "wherein allowing the heat to transfer comprises transferring heat substantially by conduction." At least this feature

of claims 2319 and 2358, in combination with the features of independent claims 2309 and 2348 respectively, does not appear to be taught or suggested by the cited art.

In the Office Action, the Examiner states: "Regarding claims 2321-2334, 2360-2373, it is deemed that the myriad hydrocarbon product mixtures recited in these claims would necessarily or obviously occur in carrying out the in situ retorting process of Terry, i.e., the precise composition of the product fluids is seen as dictated by the particular kerogen naturally occurring in the particular oil shale formation actually encountered in the field." Applicant respectfully disagrees.

Applicant submits that the product mixtures recited in claims 2321-2334 and 2360-2373 would not be producible by carrying out the in situ combustion process of Terry. The product mixtures recited in claims 2321-2334 and 2360-2373 may be produced by controlling and/or modifying formation conditions during treatment to produce the selected results recited in the claims.

For example, "Certain embodiments may include altering a composition of formation fluids produced from a coal formation by altering a location of a production well with respect to a heater well." (Specification, page 14, lines 19-21). In addition, the specification states:

> In an embodiment, compositions and properties of formation fluids produced by an in situ conversion process for coal may vary depending on, for example, conditions within a coal formation.
> (Specification, page 13, lines 16-18).

The specification further states: "Controlling pressure, heat and/or heating rates of a selected section in a formation may increase production of selected formation fluids." (Specification, page 13, lines 28-29).

An example cited in the specification discloses:

> FIG. 108 illustrates weight percentages of various carbon numbers products removed from high volatile bituminous "C" coal when coal is heated at various heating rates. Data points were derived from laboratory experiments and a Fischer assay. Curves for heating at a rate of 2 °C/day 3870, 3 °C/day 3872, 5 °C/day 3874, and 10 °C/day 3876 provided for similar carbon number distributions in the produced fluids. A coal sample was also heated in a Fisher assay test at a rate of about 17,100 °C/day. The data from the Fischer assay test is indicated by reference numeral 3878. Slow heating rates resulted in less production of components having carbon numbers greater than 20 as compared to the Fischer assay results 3878. Lower heating rates also produced higher weight percentages of components with carbon numbers less than 20. The lower heating rates produced large amounts of components having carbon numbers near 12. A peak in carbon number distribution near 12 is typical of the in situ conversion process for coal.
> (Specification, page 199, lines 13-24).

Applicant submits that the product mixtures recited in claims 2321-2334 and 2360-2373 would not necessarily or obviously occur in carrying out the in situ combustion process of Terry. Thus, Applicant respectfully submits that the Examiner's rejection of claims 2321-2334 and 2360-2373 as obvious may rely upon personal knowledge of the Examiner and therefore Applicant believes MPEP 2144.03 will apply. Pursuant to MPEP 2144.03, Applicant respectfully requests the Examiner to provide support for his assertion either by an affidavit or by references brought to the Applicant's attention. Otherwise, Applicants request this rejection be removed. *See, e.g.,* MPEP 2143.01.

Claims 2335 and 2374 describe a combination of features including: "controlling a pressure within at least a majority of the part of the formation, wherein the controlled pressure is about 2.0 bar absolute." Applicant submits that the combination of features in claims 2335 and 2374, in combination with the features of independent claims 2309 and 2348 respectively, does not appear to be taught or suggested by the cited art.

The Examiner states "As per claims 2336 and 2375, it is deemed that the non-condensable gases referred to in Terry would inherently or obviously include hydrogen; the precise amount would be dictated by the composition of the coal stratum (10) actually encountered." Applicant respectfully disagrees.

Claims 2336 and 2375 recite, in part "controlling formation conditions to produce a mixture from the formation, wherein a partial pressure of H_2 within the mixture is greater than about 0.5 bar." The features of claims 2336 and 2375, in combination with the features of the independent claims 2309 and 2348 respectively, do not appear to be taught or suggested by the cited art.

Terry does not appear to teach or suggest at least the feature of controlling formations conditions to produce a mixture containing H_2 with a partial pressure of greater than 0.5 bar. Applicant respectfully submits that the Examiner's rejection of the features of claims 2336 and 2375, in combination with the features of independent claims 2309 and 2348 respectively, as obvious matters of choice or design may rely upon personal knowledge of the Examiner and therefore Applicant believes MPEP 2144.03 will apply. Pursuant to MPEP 2144.03, Applicant respectfully requests the Examiner to provide support for his assertion either by an affidavit or by references brought to the Applicant's attention. Otherwise, Applicants request this rejection be removed. *See, e.g.,* MPEP 2143.01.

Claims 2342 and 2381 describes a combination of features including: "wherein allowing the heat to transfer comprises increasing a permeability of a majority of the part of the formation to greater than about 100 millidarcy." At least this feature of claims 2342 and 2381, in combination with the features of independent claims 2309 and 2348 respectively, does not appear to be taught or suggested by the cited art.

Claims 2343 and 2382 describes a combination of features including: "wherein allowing the heat to transfer comprises substantially uniformly increasing a permeability of a majority of the part of the formation." At least this feature of claims 2343 and 2382, in combination with the features of independent claims 2309 and 2348 respectively, does not appear to be taught or suggested by the cited art.

In addition, Applicant submits claims 2343 and 2382 are separately patentable based on

Applicant's disclosure that a section of a formation may be heated to not only increase the permeability of the formation, but also increase the permeability in a "uniform" manner. There are many advantages, as outlined in the specification, to uniformly increasing the permeability of a formation with heat. In addition, Applicant submits that the specification discloses how to heat a formation to uniformly increase the permeability.

Applicant's specification states:

> In some embodiments, superposition (e.g., overlapping) of heat from one or more heat sources may result in substantially uniform heating of a portion of a coal formation. Since formations during heating will typically have temperature profiles throughout them, in the context of this patent "substantially uniform" heating means heating such that the temperatures in a majority of the section do not vary by more than 100 °C from the assessed average temperature in the majority of the selected section (volume) being treated.
>
> Substantially uniform heating of the coal formation may result in a substantially uniform increase in permeability. For example, uniformly heating may generate a series of substantially uniform fractures within the heated portion due to thermal stresses generated in the formation. Heating substantially uniformly may generate pyrolysis fluids from the portion in a substantially homogeneous manner. Water removed due to vaporization and production may result in increased permeability of the heated portion. In addition to creating fractures due to thermal stresses, fractures may also be generated due to fluid pressure increase. As fluids are generated within the heated portion a fluid pressure within the heated portion may also increase. As the fluid pressure approaches a lithostatic pressure of the heated portion, fractures may be generated. Substantially uniform heating and homogeneous generation of fluids may generate substantially uniform fractures within the heated portion. In some embodiments, a permeability of a heated section of a coal formation may not vary by more than a factor of about 10.
>
> (Specification, page 137, line 26 through page 138, line 14).

Applicant's specification further states:

> Heating the portion of a coal formation, as described in any of the above embodiments, may substantially uniformly increase a porosity of a selected section within the heated portion. In the context of this patent "substantially uniform porosity" means that the assessed (e.g., calculated or estimated) porosity

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> of any selected portion in the formation does not vary by more than about 25 % from the assessed average porosity of such selected portion.
>
> Physical characteristics of a portion of a coal formation after pyrolysis may be similar to those of a porous bed. For example, a portion of a coal formation after pyrolysis may include particles having sizes of about several millimeters. Such physical characteristics may differ from physical characteristics of a coal formation that may be subjected to injection of gases that burn hydrocarbons in order to heat the hydrocarbons. Such gases injected into virgin or fractured formations may tend to channel and may not be uniformly distributed throughout the formation. In contrast, a gas injected into a pyrolyzed portion of a coal formation may readily and substantially uniformly contact the carbon and/or hydrocarbons remaining in the formation. In addition, gases produced by heating the hydrocarbons may be transferred a significant distance within the heated portion of the formation with a minimal pressure loss. Such transfer of gases may be particularly advantageous, for example, in treating a steeply dipping coal formation.
>
> Synthesis gas may be produced from a portion of a coal formation. The coal formation may be heated prior to synthesis gas generation to produce a substantially uniform, relatively high permeability formation. In an embodiment, synthesis gas production may be commenced after production of pyrolysis fluids has been substantially exhausted or becomes uneconomical. Alternately, synthesis gas generation may be commenced before substantial exhaustion or uneconomical pyrolysis fluid production has been achieved if production of synthesis gas will be more economically favorable. Formation temperatures will usually be higher than pyrolysis temperatures during synthesis gas generation. Raising the formation temperature from pyrolysis temperatures to synthesis gas generation temperatures allows further utilization of heat applied to the formation to pyrolyze the formation. While raising a temperature of a formation from pyrolysis temperatures to synthesis gas temperatures, methane and/or H_2 may be produced from the formation.
>
> (Specification, page 138, line 22, through page 139, line 22).

Terry does not appear to teach, suggest, or provide motivation for heating a section of a formation to increase the permeability in a uniform manner.

F. <u>The New Claims Are Not Anticipated or Obvious in view of the Cited Art</u>

Claim 5160 describes a combination of features including: "providing heat from one or more heat sources to at least a portion of the formation, wherein the heated portion of the formation is proximate the heat source; allowing the heat to transfer from the portion of the

formation to a part of the formation; and controlling the heat to yield at least about 15 % by weight of a total organic carbon content of the part of the formation into condensable hydrocarbons." Applicant submits that the cited art does not appear to teach or suggest all of the features in claim 5160 and the claims dependent thereon.

G. Conclusion

The claims have been amended above primarily for clarification purposes or in accordance with the Examiner's recommendations. Applicant submits that all claims are in condition for allowance. Favorable reconsideration is respectfully requested.

Applicant respectfully requests a one month extension of time to respond to the Office Action dated May 7, 2002. A Fee Authorization in the amount of $686.00 is enclosed to cover fees for the added claims and for a one month extension of time. If any further extension of time is required, Applicant hereby requests the appropriate extension of time. If any additional fees are required or if any fees have been overpaid, please appropriately charge or credit those fees to Conley, Rose & Tayon, P.C. Deposit Account Number 50-1505/5659-06100/EBM.

Respectfully submitted,

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Marked-Up Copy of the Amendments Submitted in Response to the Office Action Mailed on May 7, 2002

In the Specification:

On page 30, the paragraph beginning on line 1:

"Hydrocarbons" are generally defined as molecules formed primarily by carbon and hydrogen atoms~~organic material that contains carbon and hydrogen in their molecular structures~~. Hydrocarbons may also include other elements, such as, but not limited to, halogens, metallic elements, nitrogen, oxygen, and/or sulfur.

On page 53, the paragraph beginning on line 20:

As shown in FIG. 3, in addition to heat sources 100, one or more production wells ~~102~~ 104 will typically be disposed within the portion of the coal formation. Formation fluids may be produced through production well 104. ~~Production well 102 may be configured such that a mixture that may include formation fluids may be produced through the production well.~~ Production well ~~102~~ 104 may also include a heat source. In this manner, the formation fluids may be maintained at a selected temperature throughout production, thereby allowing more or all of the formation fluids to be produced as vapors. Therefore high temperature pumping of liquids from the production well may be reduced or substantially eliminated, which in turn decreases production costs. Providing heating at or through the production well tends to: (1) ~~prevent~~ inhibit condensation and/or refluxing of production fluid when such production fluid is moving in the production well proximate to the overburden, (2) increase heat input into the formation, and/or (3) increase formation permeability at or proximate the production well.

In the Claims:

2309. (Amended) A method of treating a coal formation in situ, comprising:

providing heat from one or more heat sources to at least a portion of the formation;

allowing the heat to transfer from ~~the~~ one or more heat sources to a ~~selected section~~part of the formation; and

controlling the heat to yield at least about 15 % by weight of a total organic carbon content of ~~at least some of the coal~~the part of the formation into condensable hydrocarbons.

2310. (Amended) The method of claim 2309, wherein ~~the~~ one or more of the heat sources comprise at least two heat sources, and wherein superposition of heat from at least ~~the~~ two heat sources pyrolyzes at least some hydrocarbons within the ~~selected section~~part of the formation.

2311. (Amended) The method of claim 2309, further comprising maintaining a temperature within the ~~selected section~~part of the formation within a pyrolysis temperature range.

2312. (Amended) The method of claim 2309, wherein ~~the~~ one or more of the heat sources comprise electrical heaters.

2313. (Amended) The method of claim 2309, wherein ~~the~~ one or more of the heat sources comprise surface burners.

2314. (Amended) The method of claim 2309, wherein ~~the~~ one or more of the heat sources comprise flameless distributed combustors.

2315. (Amended) The method of claim 2309, wherein ~~the~~ one or more of the heat sources comprise natural distributed combustors.

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2316. (Amended) The method of claim 2309, further comprising controlling a pressure and a temperature within at least a majority of the ~~selected section~~part of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

2317. (Amended) The method of claim 2309, further comprising controlling the heat such that an average heating rate of the ~~selected section~~part of the formation is less than about 1 °C per day during pyrolysis.

2318. (Amended) The method of claim 2309, wherein providing heat from ~~the~~ one or more of the heat sources to at least the portion of formation comprises:

heating a selected volume (V) of the coal formation from ~~the~~ one or more of the heat sources, wherein the formation has an average heat capacity (C_v), and wherein the heating pyrolyzes at least some hydrocarbons within the selected volume of the formation; and

wherein heating energy/day *(Pwr)* provided to the selected volume is equal to or less than ~~*Pwr*, wherein *Pwr* is calculated by the equation:~~

~~$Pwr =$~~ $h*V*C_v*\rho_B$,

wherein ~~*Pwr* is the heating energy/day, *h* is an average heating rate of the formation,~~ ρ_B is formation bulk density, and wherein an average ~~the~~ heating rate *(h)* of the selected volume is ~~less than~~ about 10 °C/day.

2320. (Amended) The method of claim 2309, wherein providing heat from ~~the~~ one or more of the heat sources comprises heating the ~~selected section~~part of the formation such that a thermal conductivity of at least a portion of the ~~selected section~~part of the formation is greater than about 0.5 W/(m °C).

2335. (Amended) The method of claim 2309, further comprising controlling a pressure within at least a majority of the ~~selected section~~part of the formation, wherein the controlled pressure is at least about 2.0 bar absolute.

2342. (Amended) The method of claim 2309, wherein allowing the heat to transfer comprises increasing a permeability of a majority of the ~~selected section~~part of the formation to greater than about 100 millidarcy.

2343. (Amended) The method of claim 2309, wherein allowing the heat to transfer comprises substantially uniformly increasing a permeability of a majority of the ~~selected section~~part of the formation.

2348. (Amended) A method of treating a coal formation in situ, comprising:

providing heat from one or more heat sources to at least a portion of the formation;

allowing the heat to transfer from ~~the~~ one or more heat sources to a ~~selected section~~part of the formation; and

controlling the heat to yield greater than about 60 % by weight of total condensable hydrocarbons, as measured by Fischer Assay.

2349. (Amended) The method of claim 2348, wherein ~~the~~ one or more of the heat sources comprise at least two heat sources, and wherein superposition of heat from at least ~~the~~ two heat sources pyrolyzes at least some hydrocarbons within the ~~selected section~~part of the formation.

2350. (Amended) The method of claim 2348, further comprising maintaining a temperature within the ~~selected section~~part of the formation within a pyrolysis temperature range.

2351. (Amended) The method of claim 2348, wherein ~~the~~ one or more of the heat sources comprise electrical heaters.

2352. (Amended) The method of claim 2348, wherein ~~the~~ one or more of the heat sources comprise surface burners.

2353. (Amended) The method of claim 2348, wherein ~~the~~ one or more of the heat sources comprise flameless distributed combustors.

2354. (Amended) The method of claim 2348, wherein ~~the~~ one or more of the heat sources comprise natural distributed combustors.

2355. (Amended) The method of claim 2348, further comprising controlling a pressure and a temperature within at least a majority of the ~~selected section~~part of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

2356. (Amended) The method of claim 2348, further comprising controlling the heat such that an average heating rate of the ~~selected section~~part of the formation is less than about 1 °C per day during pyrolysis.

2357. (Amended) The method of claim 2348, wherein providing heat from ~~the~~ one or more of the heat sources to at least the portion of formation comprises:

heating a selected volume (V) of the coal formation from ~~the~~ one or more of the heat sources, wherein the formation has an average heat capacity (C_v), and wherein the heating pyrolyzes at least some hydrocarbons within the selected volume of the formation; and

wherein heating energy/day *(Pwr)* provided to the selected volume is equal to or less than $h*V*C_v*\rho_B$, wherein ρ_B is formation bulk density, and wherein an average heating rate *(h)* of the selected volume is about 10 °C/day~~wherein heating energy/day provided to the volume is equal to or less than *Pwr*, wherein *Pwr* is calculated by the equation:~~

~~$Pwr = h*V*C_v*\rho_B$~~

~~wherein *Pwr* is the heating energy/day, *h* is an average heating rate of the formation, ρ_B is formation bulk density, and wherein the heating rate is less than about 10 °C/day~~.

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2359. (Amended) The method of claim 2348, wherein providing heat from ~~the~~ one or more of the heat sources comprises heating the ~~selected section~~part of the formation such that a thermal conductivity of at least a portion of the ~~selected section~~part of the formation is greater than about 0.5 W/(m °C).

2374. (Amended) The method of claim 2348, further comprising controlling a pressure within at least a majority of the ~~selected section~~part of the formation, wherein the controlled pressure is at least about 2.0 bar absolute.

2381. (Amended) The method of claim 2348, wherein allowing the heat to transfer comprises increasing a permeability of a majority of the ~~selected section~~part of the formation to greater than about 100 millidarcy.

2382. (Amended) The method of claim 2348, wherein allowing the heat to transfer comprises substantially uniformly increasing a permeability of a majority of the ~~selected section~~part of the formation.